

\$APR/HW

**COMBINED TRANSMITTAL OF APPEAL BRIEF TO THE BOARD OF PATENT  
APPEALS AND INTERFERENCES & PETITION FOR EXTENSION OF TIME  
UNDER 37 C.F.R. 1.136(d) (Small Entity)**

Docket No.  
**POM-13402/29**

In Re Application Of: **Mazumder et al**



Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/652,260	08/29/2003	Rao	25006	2125	1953

Invention: **METHOD OF FABRICATING COMPOSITE TOOLING USING CLOSED-LOOP  
DIRECT-METAL DEPOSITION**

05/08/2006 SHASSEN1 00000005 071180 10652260

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**COMMISSIONER FOR PATENTS:**

This is a combined Transmittal of Appeal Brief to the Board of Patent Appeals and Interferences and petition under the provisions of 37 CFR 1.136(a) to extend the period for filing an Appeal Brief.

Applicant(s) hereby request(s) an extension of time of (check desired time period):

☐ One month      ☒ Two months      ☐ Three months      ☐ Four months      ☐ Five months

from: February 27, 2006      until: April 27, 2006  
Date      Date

The fee for the Appeal Brief and Extension of Time has been calculated as shown below:

Fee for Appeal Brief: \$250.00

Fee for Extension of Time: \$225.00

**TOTAL FEE FOR APPEAL BRIEF AND EXTENSION OF TIME:** \$475.00

The fee for the Appeal Brief and extension of time is to be paid as follows:

☐ A check in the amount of \_\_\_\_\_ for the Appeal Brief and extension of time is enclosed.

☒ Please charge Deposit Account No. **07-1180** in the amount of **\$475.00**

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☒ Any additional filing fees required under 37 C.F.R. 1.16.

☐ Any patent application processing fees under 37 CFR 1.17.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of: Mazumder et al.

Serial No.: 10/652,260

Group No.: 2125

Filed: August 29, 2003

Examiner: Rao

For: METHOD OF FABRICATING COMPOSITE TOOLING USING CLOSED-LOOP  
DIRECT-METAL DEPOSITION

**APPELLANT'S BRIEF UNDER 37 CFR §1.192**

Mail Stop Appeal Brief  
Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**I. Real Party in Interest**

The real party and interest in this case is Jyoti Mazumder and Frank A. DiPetro, Applicants and Appellants.

**II. Related Appeals and Interferences**

There are no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. Status of Claims**

The present application was filed with 7 claims. Claims 1-7 were canceled and claims 8-12 were added by amendment in May 2005. Claim 8 has been amended by adding the limitation of claim 12 (no new matter has been added), and claims 9 and 12 have been canceled by amendment attached hereto. These amendments are reflected in the Appendix A, Claims on Appeal section of this Brief. Claims 8 and 10-11 are pending, rejected and under appeal. Claim 8 is the sole independent claim.

**IV. Status of Amendments Filed Subsequent to the Final Rejection**

An after-final amendment is attached hereto.

**V. Summary of Claimed Subject Matter**

Independent claim 8, as amended to include the limitations of claim 12, is directed to a method of fabricating or improving an object, comprising the steps of providing a substrate composed of aluminum, the substrate having a working surface forming a tool. A layer of molybdenum or an alloy thereof is deposited on the working surface using a closed-loop direct-metal deposition (DMD) process of the type wherein powder is fed to a laser-induced melt pool to create a deposit having a dimension that is optically monitored. The layer of molybdenum or an alloy thereof has a very low solubility in the aluminum. (Specification, page 3, lines 2-22).

**VI. Grounds of Objection/Rejection To Be Reviewed On Appeal**

A. The rejection of claims 8, 10 and 11 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,122,564 to Koch et al.

**VII. Argument**

A. Claims 8 and 10-11, wherein claims 10-11 stand/fall with claim 8.

Claim 12 was rejected under 35 U.S.C. §102(b) over U.S. Patent No. 6,122,564 to Koch et al. The limitations of claim 8, namely, a substrate composed of aluminum and a working surface composed molybdenum or an alloy thereof, have been moved into claim 8.

Anticipation may be established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention. RCA Corp. v. Applied Digital Data Systems, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984). Moreover, anticipation requires the presence of all elements of a claimed invention as arranged in the claim, such that a disclosure "that 'almost' meets that standard does not 'anticipate'." Connell v. Sears, Roebuck Co., 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983).

In this case, Koch et al. make no mention of aluminum and, moreover, the reference to "molybdenum" cited by the Examiner has to do with a chromium-molybdenum hot work die steel.

(‘564 patent, col. 8, lines 18+). In other words, the *substrate* disclosed in this example includes molybdenum, not the working surface. Accordingly, anticipation has not been established.

### Conclusion

In conclusion, for the arguments of record and the reasons set forth above, all pending claims of the subject application continue to be in condition for allowance and Appellant seeks the Board’s concurrence at this time.

Respectfully submitted,

By. 

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Date: April 27, 2006

**APPENDIX A**  
**CLAIMS ON APPEAL**

8. A method of fabricating or improving an object, comprising the steps of:  
providing a substrate composed of aluminum, the substrate having a working surface forming a tool;  
depositing a layer of molybdenum or an alloy thereof on the working surface using a closed-loop direct-metal deposition (DMD) process of the type wherein powder is fed to a laser-induced melt pool to create a deposit having a dimension that is optically monitored; and  
wherein the layer of molybdenum or an alloy thereof has a very low solubility in the aluminum.
10. The method of claim 8, wherein the substrate forms part of a die cast die, stamping die, trim steel, flange steel or die insert.
11. The method of claim 8, wherein the working surface includes a cutting edge, flanging surface, die surface, or die insert.

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**APPENDIX B**

**EVIDENCE**

None.

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**APPENDIX C**

**RELATED PROCEEDINGS**

None.



Response Under 37 CFR §1.116  
Expedited Procedure  
Group Art Unit 2100

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Mazumder

Serial No.: 10/652,260

Group No.: 2125

Filed: August 29, 2003

Examiner: Rao

For: METHOD OF FABRICATING COMPOSITE TOOLING USING CLOSED-LOOP  
DIRECT-METAL DEPOSITION

**AMENDMENT AND REPLY TO FINAL REJECTION**

Mail Stop AF  
Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the final Office Action mailed August 24, 2005, please amend the above-referenced application as follows:

GIFFORD, KRASS, GROH, SPRINKLE, ANDERSON & CITKOWSKI, P.C. 2701 TROY CENTER DR., SUITE 330, P.O. BOX 7021 TROY, MICHIGAN 48007-7021 (248) 647-6000



**SPECIFICATION AMENDMENTS**

*Page 1, lines 8-12:*

This invention relates to a method of fabricating manufacturing tooling such as stamping dies, trim steels, die inserts and the like which involves forming a [[base]] substrate of a first metal having relatively high ductility and low cost and forming the work-engaging areas on the space by depositing sections of a second metal using closed-loop direct-metal deposition.

*Page 3, lines 6-9:*

The present invention utilizes closed-loop direct metal deposition to deposit a working surface having the necessary properties of hardness and wear resistance, on a tooling [[base]] substrate formed of a relatively low cost wrought or cast material.

*Page 4, lines 1-8:*

The large and heavy tooling components create problems in the use of DMD processes since their high mass may make accurate translation difficult, and if the deposition must be formed on a curved surface difficulty is achieved in positioning the part relative to the laser feed. The present invention further contemplates supporting the material deposition components comprising the laser and the material feed on the wrist of a multi-axis robot which allows the beam and material to be delivered in almost any position of a large tooling [[base]] substrate.

*Page 4, line 13:*

Figures 1 is a perspective view of a [[base]] substrate for a stamping die;

*Page 4, lines 14-16:*

Figure 2 is a perspective view of a completed die formed on the [[base]] substrate of Figure 1 and having a work contacting area formed of a second metal bonded to the first metal and formed by closed-loop direct metal deposition processes;

*Page 4, lines 17-19:*

Figure 3 is a schematic view of the deposition head of apparatus for forming the die of Figure 2 on the [[base]] substrate of Figure 1, the schematic drawing including a feedback sensor;

*Page 4, lines 20-22:*

Figure 4 is a schematic view of the laser spray nozzle of Figure 3 forming a melt-pool on the [[base]] substrate of Figure 1 in the process of forming the die of Figure 2; and

*Page 5, lines 10-16:*

The completed die 10 is formed beginning with the [[base]] substrate 12 as illustrated in Figure 1. The [[base]] substrate, adapted to be supported within a stamping press, does not include the work engaging surfaces of the die and accordingly it is not subject to the same wear as the working surfaces when in use. It can generally be formed of a less wear-resistant, more ductile material and lower cost than the work-engaging surfaces of the die. For example, it might be formed as a casting from a relatively low strength steel.

*Page 5, line 17 to page 6, line 5:*

In Figure 2, work [[Work]]-engaging surfaces 14 of the die 10 are formed on the upper surface of the [[base]] substrate 12 of an alloy which is harder and more wear-resistant than the metal of the [[base]] substrate 12. In accordance with the method of the present invention, these metal engaging surfaces are formed by a process of closed-loop direct metal deposition. Such processes are disclosed in detail in a variety of issued patents such as U.S. Patent 6,122,564 which discloses feedback means for sensing the height of a deposited weld-pool and modifying the process to maintain a constant height; U.S. Patent 6,459,951 which employs a two-color imaging pyrometer to analyze and control the deposition; and U.S. Patent 6,518,541 which measures the duty cycle of the laser during the deposition cycle and controls the process parameters to maintain the duty cycle within a desired range.

CLAIM AMENDMENTS

1. - 7. (Canceled)

8. (Currently Amended) A method of fabricating or improving an object, comprising the steps of:

providing a substrate composed of ~~a first metal~~ aluminum, the substrate having a working surface forming a tool;

depositing a layer of ~~material~~ molybdenum or an alloy thereof on the working surface using a closed-loop direct-metal deposition (DMD) process of the type wherein powder is fed to a laser-induced melt pool to create a deposit having a dimension that is optically monitored; and

wherein the layer of ~~material~~ molybdenum or an alloy thereof has a very low solubility in the ~~first metal~~ aluminum.

9. (Canceled)

10. (Original) The method of claim 8, wherein the substrate forms part of a die cast die, stamping die, trim steel, flange steel or die insert.

11. (Currently Amended) The method of claim 8, wherein the working surface[[,]] includes a cutting edge, flanging surface, die surface, or die insert.

12. (Canceled)

**REMARKS**

By this amendment, the limitation of claim 12 has been placed into independent claim 8, and claim 12 has been canceled. In addition, claim 9 has been canceled. Claims 8 (as amended), 10 and 11 are presented for reconsideration of the Examiner along with the arguments presented in the accompanying Appeal Brief.

Respectfully submitted,

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Dated: April 27, 2006